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796 F.2d 436
230 U.S.P.Q. 313
In re Richard M. DEMINSKI.
Appeal No. 85-2267.
United States Court of Appeals,
Federal Circuit.
July 8, 1986.

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David E. Schmit, Frost & Jacobs, Cincinnati, Ohio, argued, for appellant. With him on brief, was Timothy J. O'Hearn, Cincinnati, Ohio.

John C. Martin, Associate Sol., Arlington, Va., argued, for appellee. With him on brief, were Joseph F. Nakamura, Solicitor, Washington, D.C., and Fred E. McKelvey, Deputy Sol., Woodbridge, Va.

Before BALDWIN, SMITH, and NEWMAN, Circuit Judges.

EDWARD S. SMITH, Circuit Judge.

This is an appeal by Richard M. Deminski (Deminski) from the February 25, 1985, decision of the Patent and Trademark Office Board of Patent Appeals and Interferences (board), in which the board affirmed the examiner's final rejection, under 35 U.S.C. Sec. 103, of certain claims in Deminski's utility patent application, serial No. 177,863, relating to a high pressure gas transmission compressor. We affirm in part and reverse in part.

Issue

The issue is whether the board erred in affirming the examiner's rejection of claims 1-3, 6, 7, 17, 18, and 21 of the Deminski patent application, under 35 U.S.C. Sec. 103, as unpatentable over the prior art. We affirm the rejection of claims 1-3, 6, and 7. We reverse the rejection of claims 17, 18, and 21.

Deminski's Invention

Deminski's invention "relates generally to double-acting high pressure gas transmission compressors," such as those used "for transmitting natural gas and other compressible fluids through pipe lines." More particularly, the invention is directed to a horizontally reciprocating, double-acting piston type gas compressor in which the valves can be removed easily for replacement.

The embodiment of Deminski's invention (Fig. 1) includes a block-like compressor housing (2) with a horizontal cylinder (3) which extends longitudinally through the housing and a double-acting piston (9) carrying piston rings (14). There are four openings (30) in the cylinder, with passageways (38) to four vertically disposed cylindrical valve chambers (32), which chambers are located at the four corners of the compressor housing (2). A suction valve (50), a discharge valve (40), and a baffle between the valves form a valve assembly which may be withdrawn as a unit from valve chamber (32).

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Claims on Appeal

Claims 1, 3, 6, 7, 17, 18, and 21 were rejected under 35 U.S.C. Sec. 103 as unpatentable over Pocock U.S. Patent No. 1,226,693 in view of British Patent No.

1,332,774 and Shallenberg U.S. Patent No. 1,976,464. Briefly, the examiner and the board stated that it would have been obvious in view of the British reference to add two more valve chambers to Pocock, and in view of Shallenberg to move the cylinder upwardly so that it is above the bottom of the valve chambers.

Claim 2 was rejected under 35 U.S.C. Sec. 103 as unpatentable over Pocock in view of the British reference and Shallenberg, and further in view of Kovach which teaches the use of a piston ring in a double-acting piston pump.

Prior Art Relied Upon by the Board

A. Pocock.

Pocock's U.S. Patent No. 1,226,693 teaches a double-acting piston pump. The pump is typically small and is used to pump water out of underground mines.

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A significant feature of Pocock is that the valve stem (27) (Figs. 2, 3) is easily removable because it is not rigidly connected to the valves or the valve seats. After the valve stem is removed, the valve pieces can be removed either by turning the pump upside down or by withdrawing the pieces one at a time with tools or by hand.

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Pocock shows two valve housings (14) located along the same side of the pump cylinder. The valve housings are vertically

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oriented, so that the valves can be removed vertically through the top of the housing. The Pocock structure does not allow for removal of the valve assembly as a unit.

B. British Patent.

The British Patent No. 1,332,774 is directed to a double-acting piston compressor with a horizontal cylinder (2), such as a high capacity piston compressor for use with gas pipelines (Fig. 4). The British patent shows four horizontal valve chambers. Two of the valve chambers are located above the cylinder and two of the chambers are located below the cylinder. Each valve chamber is perpendicular to the cylinder.

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C. Shallenberg.

Shallenberg, U.S. Patent No. 1,976,464, teaches a double-acting piston pump with a particular valve construction. The structure includes two distinct and separate valve chambers situated above the cylinder (Fig. 5). Each valve chamber contains two valves of the same type (i.e., either two suction valves or two discharge valves). The disclosure indicates that two of the four valves could be placed below the cylinder and two above the cylinder but that the inventor believes it preferable to arrange them all above the cylinder because "that enables more ready installation and removal of the valves."

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D. Kovach.

Kovach, U.S. Patent No. 1,946,166, discloses a particular valve construction for a

reciprocating piston air pump. The only feature relied on by the examiner and by the board is that the piston is provided with piston rings as a seal.

Obviousness

A. Prior Art and Ordinary Skill in the Art.

Deminski argues that the references applied by the examiner and by the board "are not properly contained within the scope of the [relevant] prior art," i.e., they are "nonanalogous." Deminski contends that none of the references should be considered as prior art because none is directed to the problem of removing worn or damaged valves from compressors. In Deminski's view, the examiner and the board defined the problem too broadly by including both compressors and pumps in the prior art.

Deminski cites *Stratoflex, Inc. v. Aeroquip Corp.*, in which this court stated that "[t]he scope of the prior art has been defined as that 'reasonably pertinent to the particular problem with which the inventor was involved.'"¹ The question in *Stratoflex*

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as whether rubber hose should be considered as prior art relevant to the claimed PTFE tubing. In finding that rubber hose was prior art, the court focused on only the second step of the two-step test for nonanalogous art which test had been stated in *Wood* in the following terms: 2

The determination that a reference is from a nonanalogous art is therefore two-fold. First, we decide if the reference is within the field of the inventor's endeavor. If it is not, we proceed to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved.

Here, the references satisfy the first inquiry because they are "within the field of the inventor's endeavor" of horizontally

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reciprocating, double-acting piston devices for moving fluids. We agree with the board that the cited pumps and compressors have essentially the same function and structure: they move fluids by means of a double-acting piston, a cylinder, and valves. 3 Consequently, the field of endeavor is the same for an inventor of either a pump or a compressor of the double-acting piston type. 4 Thus, the Pocock "pump" was correctly considered as prior art for the Deminski "compressor." It is even more clear that the British and Kovach references are within Deminski's field of endeavor because they are directed to compressors having horizontally reciprocating, double-acting pistons.

B. Whether Deminski's Invention Would Have Been Obvious.

We affirm the board's decision insofar as it affirms the examiner's rejection of claims 1, 3, 6, and 7 under 35 U.S.C. Sec. 103 as unpatentable over Pocock in view of the British Patent No. 1,322,774 and Shallenberg. The examiner and the board correctly found that it would have been obvious in view of the British reference to add two more valve chambers to Pocock and in view of Shallenberg to move the cylinder upwardly so that it is above the bottom of the valve chambers.

We also affirm the rejection of claim 2 under 35 U.S.C. Sec. 103 as unpatentable over Pocock in view of the British reference, Shallenberg, and further in view of Kovach, which teaches the use of a piston ring in a double-acting piston pump.

We reverse the board's decision insofar as it affirms the examiner's rejection of claims 17, 18, and 21. The latter claims have the limitation that the valve sets in each valve chamber be connected in a way which will permit them to be withdrawn as a unit. There is nothing in the prior art references, either singly or in combination, "to suggest the desirability, and thus the obviousness," of designing the valve assembly so that it can be removed as a unit. 5

Simply put, Deminski solved the problem of how to remove the valve assembly by

designing a compressor with four vertically oriented valve chambers. Each chamber

AFFIRMED IN PART, REVERSED IN PART.

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contains a valve assembly which can be removed as a unit through the opening at the top of the valve chamber. Each of the four valve assembly units may be removed relatively easily by lifting vertically with a hoist.

Pocock teaches a pump in which only the valve stem is separately removable and replaceable. The Pocock structure requires the valve pieces to be removed item-by-item, by turning the pump upside down, by using a tool, or by hand. Because the Pocock structure is typically small, Pocock does not address Deminski's problem of how to remove a large and heavy valve assembly as a unit. Instead, Pocock teaches away from the invention of claims 17, 18, and 21 of Deminski's patent application.

There was no suggestion in the prior art to provide Deminski with the motivation to design the valve assembly so that it would be removable as a unit. The board argues that if Pocock had followed the "common practice" of attaching the valve stem to the valve structure, then the valve assembly would be removable as a unit. The only way the board could have arrived at its conclusion was through hindsight analysis by reading into the art Deminski's own teachings. Hindsight analysis is clearly improper, since the statutory test is whether "the subject matter as a whole would have been obvious at the time the invention was made." 6

Conclusion

We affirm the board's decision insofar as it affirmed the examiner's rejection of claims 1-3, 6, and 7 in Deminski's patent application. We reverse the board's decision insofar as it affirmed the examiner's rejection of claims 17, 18, and 21 as unpatentable over the prior art under 35 U.S.C. Sec. 103.

1 Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 1535, 218 USPQ 871, 876 (Fed.Cir.1983) (quoting in turn from *In re Wood*, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979)).

2 *Wood*, 599 F.2d at 1036, 202 USPQ at 174.

3 See *In re Ellis*, 476 F.2d 1370, 1372, 177 USPQ 526, 527 (CCPA 1973) (cross reference in official search notes is some evidence of analogy, although "the similarities and differences in structure and function of the inventions disclosed in the references *** carry far greater weight"). The nearly identical classifications of the application and references in the present case are the result of the close similarity in structure and function of the invention and the prior art.

4 Deminski argues at length that the scope of his claims is limited by the language "a high-pressure gas transmission compressor." We need not decide whether the preamble is limiting in this case because the prior art would be the same for either pumps or compressors of the double-acting piston type. We acknowledge, however, that the prior art did not address Deminski's problem of how to remove a large and heavy valve assembly as a unit.

5 *Fromson v. Advance Offset Plate, Inc.*, 755 F.2d 1549, 1556, 225 USPQ 26, 31 (Fed.Cir.1985) (quoting *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed.Cir.1984)) (emphasis added in *Fromson*).

6 35 U.S.C. Sec. 103 (1982); *In re Sponnoble*, 405 F.2d 578, 585, 160 USPQ 237, 243 (CCPA 1969).